Hideaki OHBA*: **New or critical species of Asiatic Sedoideae (6)****

大場秀章*: アジア産マンネングサ亜科の分類学的研究（6）***

(12) On *Sedum doratocarpum* Fröd. and *S. alsium* Fröd.

There are some species related with *Rhodiola macrocarpa* (Praeger) Fu in the region from E. Himalaya to S. W. China. *Sedum doratocarpum* and *S. alsium*, which were described by Fröderström (1942) based on H. Smith collection from Szechuan, S. W. China, are obviously regarded as its allies.

Sedum doratocarpum was considered to be closely allied to *Rhodiola fastigiata* (Hook. f. et Thoms.) Fu of the sect. Chamaerhodiola, from which it was distinguished by the entire leaves, the very large fruits, and the slender, short-styled carpels (Fröderström 1942). But *S. doratocarpum* apparently belongs to the sect. Rhodiola of *Rhodiola* by the lack of both conspicuously fastigiate, marcescent flowering stems and the developped flower-tube. Though specimens cited in its description (Smith 11610 [type] & 10566) are consisting of female plant only, *S. doratocarpum* is well distinguishable from *R. macrocarpa* as shown in the following key:

Leaves obtrullate—very narrowly lanceolate, serrate, 20-45×4-11 mm in size. Ovaries broad, round dorsally, 9-11 mm long, 2.4-2.5 mm wide. Flowering stems and inflorescence-axes papillate .... *Rhodiola macrocarpa*

Leaves linear—very narrowly elliptic, entire (—sparsely minutely dentate), 8-16×2-3 mm in size. Ovaries slender, hardly gibbose dorsally, 7-11 mm long, 1.5-2(-2.3) mm wide. Flowering stems and inflorescence-axes nearly smooth .... *Sedum doratocarpum*

Thus, *S. doratocarpum* is regarded as a distinct species of the genus *Rhodiola*.

On the other hand, *Sedum alsium* was considered to be related to *R. fastigiata* and *R. himalensis* (D. Don) Fu in the sect. Chamaerhodiola. This species had been known until then only from two Smith collections; Fröderström (1942) designated no. 10571 as the type of the male and no. 11368 as

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[*] Botanical Gardens, Nikko, Faculty of Science, University of Tokyo, Hanaishi-cho 1842, Nikko, 321-14 Japan. 東京大学理学部附属植物園日光分園.

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the type of the female. Therefore, Smith 10571 and 11368 (both in UPS) are regarded as the syntype of *S. alsium* Fröd. However, *S. alsium* is consisting of two entirely different entities. Smith 11368 is undoubtedly identical with *Rhodiola himalensis* (D. Don) Fu, while the male plant of no. 10571 is regarded as the male representative of *S. doratocarpum*. In such circumstances *S. alsium* might be rejected under Article 70 of the International Code of Botanical Nomenclature. However, *S. alsium* was already removed to the genus *Rhodiola* by Fu (1965), who did not realize this matter. Therefore, I propose here to retain the name *Sedum alsium* for the part of the male type belonging to *S. doratocarpum*. Then, *S. doratocarpum* is reduced to the synonymy of *R. alsia* (Fröd. [auctor hic corrigit]) Fu.

Rhodiola alsia (Fröd.) Fu in Act. Phytotax. Sin. Addit. 1: 121 (1965).

Sedum alsium Fröd. in Act. Hort. Gothob. 15: 8 (1942), pro parte, excl. fig. 42-52 et descript. toto pl. femin., quae *Rhodiola himalensis* sunt.

Sedum doratocarpum Fröd. in Act. Hort. Gothob. 15: 7, fig. 31-38, Pl. 3-3 (1942).

Specimens examined. *Rhodiola alsia*: S.W. China. Sikang. Taofu (Dawo) distr.: mont. austr. Mt. Yara, N.W. glacier valley, alt. ca. 4200 m. In *Rhododendretis* (H. Smith 11610, UPS—Holotype of *Sedum doratocarpum* Fröd., GB—Isotype); Kangting (Tachienlu) distr., Yülingkong, Gomba La, alt. ca. 3700 m. In lapidosis in alti-*Rhododendretis* (H. Smith 10566, UPS, GB); distr. cit., Yülingkong, montes Yachiagan, alt. ca. 4300 m. In saxo (H. Smith 10571 (pro parte, excl. pl. ♀ [=*Rhodiola himalensis*]), UPS—Lectotype of *Sedum alsium* Fröd., GB—Isolectotype).

Rhodiola himalensis: Sikang. Kangting (Tachienlu) distr., Tapaoshan, alt. ca. 4600 m. In rupibus calcareis (H. Smith 11368 ♀, UPS—Syntype of *Sedum alsium* Fröd.).

(13) On *Rhodiola algida* (Ledeb.) Fisch. et C.A. Meyer

Rhodiola algida (Ledeb.) Fisch. et C.A. Meyer was treated as the member of the series Algida in the section Eu-Rhodiola (=Rhodiola) (Borissova 1939) or of the section Rhodiola in the subgenus Rhodiola (Ohba 1978). *Sedum algidum* Ledeb., the basionym of *R. algida*, was described as having hermaphrodite flower (Ledebour 1830). Maximowicz (1883) recognized it as having both hermaphrodite and dioecious nature. But all the other species of the subgenus Rhodiola have dioecious nature only (Ohba 1978). Thus, the re-

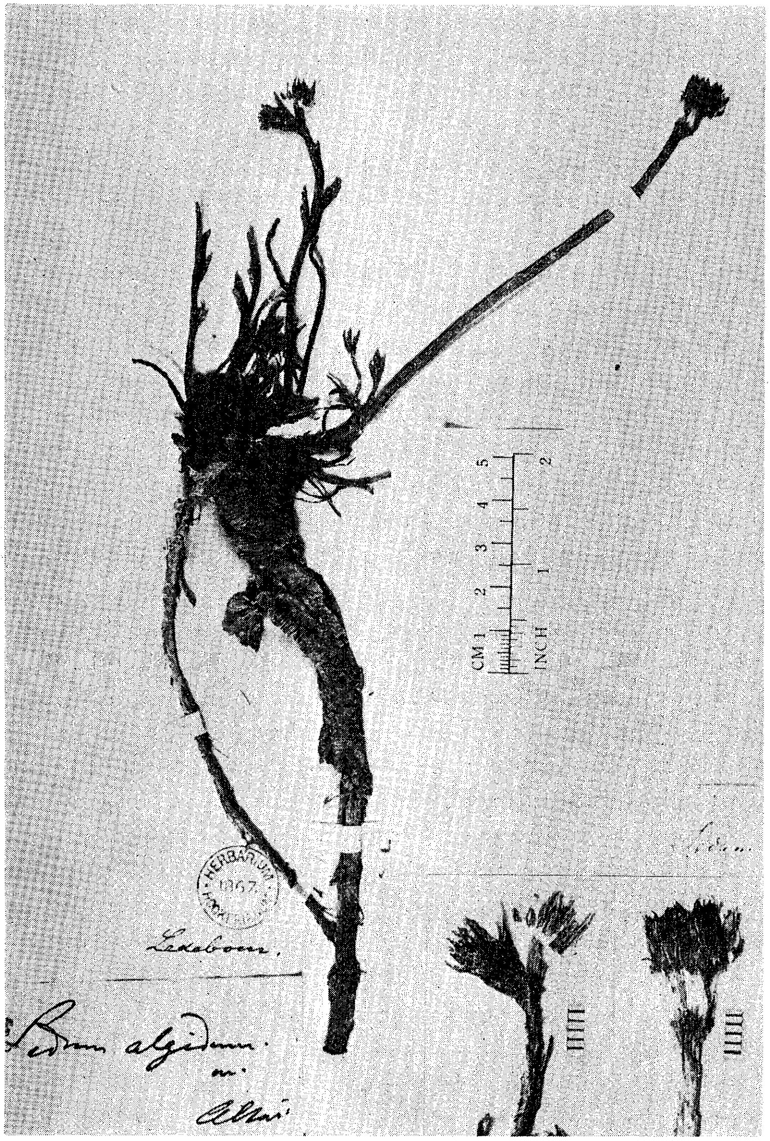

Fig. 1. Isotype of *Sedum algidum* Ledeb. (K).

examination of its authentic specimens are necessary to decide its systematic position as well as its circumscription. Recently, I have had an oppotunity to examine the isotype specimen (K), which well agrees with Tab. 418 of Ledebour's Icones Plantarum Floram Rossicam (1834) (Fig. 1). As the result it becomes clear that *S. algidum* has hermaphrodite flower as described and illustrated by Ledebour, and is apparently related with *Rhodiola dumulosa* (Franch.) Fu in the subgenus Crassipedes (Praeger) H. Ohba. Therefore, *Rhodiola algida* should be classified in the subgen. Crassipedes. The nearest species, *Rhodiola dumulosa* is clearly distinguishable from *R. algida* by 1) the bell-like flowers having erect or suberect petals with abruptly outcurved apical part, 2) longer (2.8-3.2 mm long) calyx-tube, 3) narrowly oblong, oblanceolate or narrowly obovate petals (8-11×1.8-2.3 mm in size), and 4) longer (1.2-1.7 mm) style. From *R. Wallichiana* *R. algida* is distinguished by 1) the stamens shorter than the petal, 2) the erect petals, and 3) entire or nearly entire leaves.

Bunge (1854) described *β. longifolium* in *S. algidum* from Mts. Karatau, Turkestan based on a Lehmann's collection. Maximowicz (1883) divided *S. algidum* into three varieties, i.e. *α. altaicum* Maxim. from Altai & Tangut, *β. tanguticum* Maxim. from Tangut, S. Mongolia & N. China, and *γ. jeniseense* Maxim. from N. Mongolia. Until then *R. algida* was extended the range from Turkestan to N. China through Altai, Tangut and Mongol. After that *R. algida* was reported to occur in eastern China (Shensi, Shansi & Hopei) (Limpricht 1922) and S.W. China (Yunnan & Szechuan) (Praeger 1921, Fröderström 1924).

R.-Hamet (1929) considered that a part of the syntype specimens of *β. tanguticum* Maxim. comes near to a dioecious species and the remains (4 sheets) are *Sedum dumulosum*. Although *β. tanguticum* was described as "flores dioici", *S.* (=*Rhodiola*) *dumulosum* has hermaphrodite nature (Ohba 1980). Maximowicz (1883) wrote: "Flores masculi...ovariis quam in gracilioribus petala aequantibus exovulatis...petala sepalis parum longiora". This description seems partly to come from specimens belonging to different species. There is no species characterized by the "petala sepalis parum longiora" in 'dioecious' *Rhodiola* (i.e. *Rhodiola* subgen. Rhodiola). Dioecious species of *Rhodiola* have petals apparantly longer than the sepal in male and *vice versa* in female. The ovaries of the male plant are always lesser than the half of the petal. Therefore, these two characters of *β. tanguticum* appear to be attributed to a certain species with hermaphrodite flowers such as *Rhodiola dumulosa*. Thus, *β.*

tanguticum should be excluded from *R. algida*.

Fröderström (1924) determined H. Smith 4262 (UPS) as *S. algidum* (?) var. *longifolium* Bunge. This specimen, however, represents a rather stout form of *Rhodiola alsia* (Fröd.) Fu. Pratt 105 (E), which determined as *S. algidum* var. *tanguticum* by Praeger (1921), seems to be an intermediate form between *R. Kirilowii* (Regel) Regel ex Maxim. and *R. nobilis* (Franch.) Fu. Maire 262 (E) which determined as *S. algidum* by Praeger is *R. alsia*. Therefore, *Sedum algidum* recorded from S.W. China is probably *Rhodiola alsia* (Fröd.) Fu or its allied species such as *R. Kirilowii* (Regel) Regel ex Maxim. or *R. macrocarpa* (Praeger) Fu. R.-Hamet (1929) already re-identified all the specimens cited by Limpricht' (1922) as *Sedum dumulosum*. *Sedum algidum* *β. longifolium* Bunge is also necessary to re-examine the type specimen. The *β. longifolium* is possibly compared with *Rhodiola Semenovii* (Regel et Herd.) A. Boriss., though Fedtschenko (1911) considered that it should be not rather that. At the present, *R. algida* seems to be restricted within the region from Mts. Altai to N. Mongolia.

The description of *R. algida* may be emended based on the isotype specimen as follows:

A perennial herb, up to 18 cm high. Rhizomes massive, with one or a few slender dauciformed roots, the apical part short branched in several times, crowned by the scaly radical-leaves. Scaly radical-leaves persistent, ovate—triangular-ovate with entire margin, acute—obtuse at the apex, 4-7 mm long, 3-5 mm wide, brown. Flowering stems 1-3 from each branch-apex of rhizomes, deciduous but often remaining one year after death, 6-18 cm long, 2-3 mm thick, erect, simple, terete, glabrous, laevis. Leaves alternate, rather densely arranged throughout, sessile, spurless, thick herbaceous, flattish, 0.8-2 cm long, (1-)1.5-3 mm wide, linear—linear-lanceolate, entire along the margin, acute—abruptly acumiante at the apex (the apex itself round), round-truncate—round at the base, ascending, glabrous, laevis, the costa not prominent. Inflorescences terminal, 30-60-flowered, a compact umbell-like cyme, (?) inconspicuously bracteate, 1-2 cm long, 2-2.5 cm wide. Bracts (?). Flowers hermaphrodite, (4-)5-merous, erect at anthesis, 3-4 mm wide, pedicellate; pedicels 2-3 mm long at anthesis, later elongate up to 7-8 mm long. Calyx fleshy, green, glabrous, laevis, the tube 0.8-1.2 mm long, the lobes lanceolate—linear-lanceolate, tapering towards the apex (the apex itself round), entire along the margin, 3-4 mm long, ca. 1 mm wide. Petals free, linear-lanceolate, 7-8 mm long, 1.5-1.7 mm wide, obtuse at the apex, entire along the margin, ± boat-shaped, erect at anthesis. Stamens distinctly shorter than the petal, erect, the filaments linear-filiform, ca. 5 mm long; anthers basifixed, ovate, ca. 0.7 mm long. Nectar-scales (?). Gynoecia 4 mm long at anthesis, ca. 8 mm long after anthesis, the ovaries erect, ventrally not gibbose, the style very short, less than 1 mm long.

Rhodiola (Subgen. Crassipedes) **algida** (Ledeb.) Fisch. et C. A. Meyer, Enum. Pl. Nov. Schrenk lect. **1**: 79 (1841)—A. Boriss. in Komarov, Fl. USSR **9**: 37 (1939)—H. Ohba in Journ. Fac. Sci. Univ. Tokyo, Sect. III, **12**: 189 (1978).

Sedum algidum Ledeb. in Fl. Altaica **2**: 194 (1830); Icon. Pl. Fl. Ross., Tab. 418 (1834); Fl. Ross. **2**: 177 (1843)—Maxim. in Bull. Acad. Sci. St.-Pétersb. **29**: 125 (1883), pro parte, excl. *β. tanguticum* Maxim., incl. *α. altaicum* et (?) *γ. jeniseense* Maxim.—Forbes et Hemsl. in Journ. Linn. Soc. Bot. **23**: 283 (1887), versim.—R.-Hamet in Candollea **4**: 5 (1929), cum var. *altaicum* Maxim. et *euphorbioides* (Schlechtend. ex Ledeb.) R.-Hamet—Berger in Engler et Prantl, Nat. Pfl.-fam. 2 Aufl. **18a**: 442 (1930), cum var. *altaicum* et *jeniseense* Maxim. pro parte versim.—Fröd. in Act. Hort. Gothob. **5**: append. 34, Pl. 9 (1930), pro parte, excl. fig. 87-95.

Sedum euphorbioides Schlechtend. ex Ledeb., Fl. Ross. **2**: 177 (1843).

Sedum algidum α. altaicum Maxim. in Bull. Acad. Sci. St.-Pétersb. **29**: 126 (1883).

Sedum algidum γ. jeniseense Maxim., l. c., versim.

Sedum algidum var. *euphorbioides* (Schlechtend. ex Ledeb.) R.-Hamet in Candollea **4**: 5 (1929).

Specimens examined. Fl. Altai (Ledebour s. n., K—Isotype, Fig. 1); loc. cit. (Bunge s. n., K).

Rhodiola dumulosa (Franch.) Fu: H. Ohba in Journ. Fac. Sci. Univ. Tokyo, Sect. III, **12**: 401 (1980).

Sedum algidum Ledeb. *β. tanguticum* Maxim. in Bull. Acad. Sci. St.-Pétersb. **29**: 126 (1883), pro maj. parte [Fide R.-Hamet 1929].

Sedum algidum (non Ledeb.) Limpricht, f. in Fedde, Repert. Beiheft. **12**: 391 (1922) [Fide R.-Hamet 1929].

Rhodiola alsia (Fröd.) Fu (See p. 296).

"*Sedum algidum* Ledeb." Praeger in Not. Bot. Gard. Edinb. **13**: 69 (1921) pro parte, incl. Maire 262—Fröd. in Act. Hort. Gothob. **1**: 25, fig. 1(10-15), Pl. 11

(4) (1924).

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(12) 東部ヒマラヤ，ビルマ北部，中国南西部には *Rhodiola macrocarpa* とそれに関連した種がいくつかある。*Sedum alsium* Fröd. と *S. doratocarpum* Fröd. はそうした種のひとつで，同時に Harry Smith の四川採集品にもとづいて記載されている。*S. doratocarpum* は *R. macrocarpa* に近縁であるが葉の形と長さ，子房の形，花茎と花序軸の乳頭状突起の有無によって区別される。Fröderström が記載に用いた標本を検討した結果，*S. alsium* は *S. doratocarpum* の雄株と *Rhodiola himalensis* の雌株からなる合成種であることが判った。しかし伝書遐 (1965) によって *S. alsium* はすでにイワベンケイ属に移されているので，*S. alsium* の雄株のタイプである H. Smith 10571 (UPS) を Lectotype に選び，*S. alsium* の雄株と *S. doratocarpum* との学名に *Rhodiola alsia* (Fröd.) Fu を採用する見解を述べた。

(13) 両性花を有する *Rhodiola algida* (Ledeb.) Fisch. et C.A. Meyer はアルタイ山脈からタングート，モンゴルを経て中国北部や西シベリヤに分布しているが，トル

キスタン地方や中国東部と西南部からも採集品が報告されている。中国東部から Maximowicz (1883) と Limpricht (1922) が報告した本種の大部分は *R. dumulosa* であることが R.-Hamet (1929) によって明らかにされている。中国西南部の記録のもとになった標本の多くを調べたがいずれも *R. algida* と異っており，*R. alsia* など雌雄異株の種類であった。それゆえ確実な標本が新たに得られるまで中国西南部のフロラから本種を除いておくのがよいと考える。本種は *R. dumulosa* (Franch.) Fu に近縁であるが，花の形，花弁の形と大きさ，花柱の長さ，蕚筒の長さが主に異なる。

□ Dassanayake, M.D. & F.R. Fosberg (ed.): **A Revised Handbook to the Flora of Ceylon** Vol. I. 508 pp. Feb. 1980. Smithsonian Institution, Washington. セイロンの植物誌は Henry Trimen が1893年から1900年にかけて The Handbook to the Flora of Ceylon にまとめ，100枚の美しい色彩図と共に5冊の本を出版している。また A.H.G. Alston が1931年に補遺を1冊追加した。セイロンは交通の要路にあたり，*zeylanica* とか *ceylandica* と名づけられた植物が多いことからも示されるように，古くから多くの植物が採集され研究されていたため，種類の基準となる植物が多い。したがって，Trimen の著書はセイロンの植物のみならず，アジア熱帯の植物研究に欠かせない重要な文献である。しかし出版されてから80年たち，古典としての価値に変りはないが，学名など現在の水準からはかなり古くなり，不適当なものが多くなっている。

1968年から Smithsonian Institution の Fosberg 博士を中心として，新しい資料のもとに再検討の計画が立てられ，各科が多くの分担者によって研究がつづけられている。本書はその一部が第1巻として出版されたものである。

研究のまとまった科からのせられたと見られ，一定の順序はなく，Amaranthaceae, Bombacaceae, Guttiferae, Compositae, Connaraceae, Dipterocarpaceae, Elatinaceae, Fabaceae (part), Mimosaceae がのせられている。キク科が大きく，全体の三分の一を占めている。キク科やヒユ科などは熱帯に広く分布する種類が多く，日本南部の植物にも関係するものがある。

本書の一つの特色は，使用している学名の基準標本をたんねんに挙げていること，研究に使った標本の主なものを記録していることである。標本の引用は読者にとってはわずらわしいように思われ，頁数を制限するさい削られることが多いが，再検討のさいの基礎となるので，長期的な視点からは重要なものである。これらの点が考慮されているので，本書が完成すればアジア熱帯の植物研究には欠かせない文献となるであろう。

（山崎　敬）